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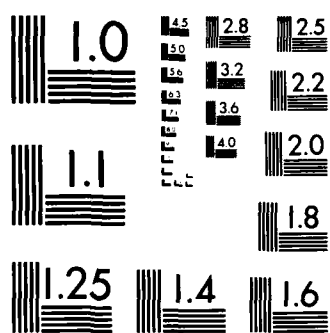
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RESOURCES**

**WEAPON SYSTEM AND EQUIPMENT SUPPORT ANALYSIS:
DEVELOPMENT OF MANAGEMENT AND APPLICATION HANDBOOK**

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SUMMARY

The objective of this project was to conduct the background survey and information-gathering research required to develop a handbook devoted to management and application of weapon system and equipment support analysis. The major task areas were (a) to develop the handbook content and outline, (b) to identify and acquire related background documentation, (c) to review the background documentation, (d) to conduct field site meetings and analyze the collected information, (e) to develop and write the handbook, and (f) to document the results in a technical paper.

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PREFACE

This paper discusses the tasks performed in developing a draft handbook for weapon system and equipment support analysis management and application. The handbook was developed by Westinghouse Electric Corporation under contract F33615-81-C-0016 for the Air Force Human Resources Laboratory (AFHRL), Logistics and Human Factors Division. This effort is a part of the Logistics Feasibility and Team Training Impact Studies Program.

The reason for publishing what essentially are the working notes on the handbook at this late date is to disseminate the lessons learned. After a recent reevaluation of this project, as part of a continuing process to review past efforts in order to improve current research methods, it became apparent that the successes and difficulties encountered in problem formulation, research techniques, questionnaire development, etc., could benefit others contemplating a similar venture.

The professional guidance and assistance provided by AFHRL personnel, especially Lt J.O. Griffin, and Air Force Acquisition Logistics Division personnel, Ms. R.W. Fulford, Mr. K.L. Morris, and Mr. P.E. Chuites, was greatly appreciated. Their assistance in providing background study information, gathering and furnishing documentation, arranging for the field survey meetings, and participating in the survey activities enhanced the handbook content and complemented the survey observations. Captain D.F. Spray was the AFHRL Contract Monitor. Other Westinghouse personnel, Mr. R.C. Banta, Mrs. D.L. Smith, Mr. W.L. Miller, Ms. B.L. Frederick, and Ms. D.A. Button, contributed to the writing and production of this paper.

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WEAPON SYSTEM AND EQUIPMENT SUPPORT ANALYSIS: DEVELOPMENT OF MANAGEMENT AND APPLICATION HANDBOOK

I. INTRODUCTION

Logistics Support Analysis (LSA) Managers are responsible for weapon systems that are outfitted with the most economical and effective logistics support to ensure combat effectiveness. In order to meet this objective, these managers must be able to assess the LSA requirements of their particular programs throughout the system acquisition process. The alleged difficulties lay in the assessment arena. The difficulties were purported to range from not knowing what phases their particular programs were in to not understanding what analytical techniques should be applied and when to reap the most meaningful results. Coupled with limited training and perhaps less experience, these managers often found themselves in unenviable positions within the system acquisition community.

The LSA managers needed a handbook that would serve as a roadmap. A handbook could assist these managers in much the same fashion as a roadmap does motorists, by helping them read the signposts along the way. It could help them read the signs as to which phases of system acquisition they were in, what analysis tools had to be used at that time, what preliminary work had to be completed, and who were the recipients of their output. It would also be a training aid. It would help clarify the interrelationships and interdependencies among key system acquisition players whose idealized integrated efforts produce weapon systems of the highest quality and supportability. This paper describes the process used to develop a draft of such a handbook.

II. OBJECTIVES

The major objectives of this task were as follows:

1. Conduct the background survey and information-gathering research required to develop a handbook devoted to management and application of WSESA.
2. Document the management guidance in a draft handbook.
3. Record the major findings of the survey interviews and related handbook development activities in a technical paper.

In accomplishing these objectives, two major questions had to be addressed. The first question was concerned with how the handbook should be structured to meet the expected needs of the user audience. The second question involved establishing a direct understanding of the user requirements and revealing problems facing those individuals who were required to execute and perform WSESA programs.

III. TECHNICAL APPROACH

The WSESA handbook development and background research covered a 7-month period from May to December 1982. An additional month was required to prepare the final research documentation that contained the analysis and survey findings. In carrying out this research, six major task areas were involved:

1. Develop the handbook content and outline.
2. Identify and acquire related background documentation.
3. Review the background documentation.
4. Conduct field-site meetings and analyze the collected information.
5. Develop and write the handbook.
6. Document the results in a technical paper.

At the beginning of this effort, multiple tasks were ongoing in order to gather the required background material essential for the handbook development and writing. Specifically, the detailed planning for the surveys, carrying out the survey meetings, and the initial writing tasks were begun simultaneously. After the field surveys were completed, all tasks emphasis was placed on compiling the handbook sections and on properly reflecting the survey knowledge gained in the handbook content.

Task 1 - Handbook Content Development

The overall handbook development required that experienced, senior personnel develop the initial technical approach and establish the initial handbook content requirements. To present a "strawman" for discussions, it was necessary that the outline reflect a preconceived concept of the final organization of the book and of the presentation techniques that were to be used. Some of this work (flow chart text by phases, use of Hierarchical-Input-Process-Output¹ charts, etc.) had been previously evaluated on other Air Force programs. This initial approach was subsequently modified, improved, and verified by the technical team. The final handbook outline and presentation content was established as a feasible and informative method for organizing and documenting the required information. The final handbook table of contents is contained in Appendix A.

The major constraints reflected in the initial handbook outline and during handbook development were:

1. Prepare the handbook to the requirements of Military Standard (MIL STD) 1338A. (November 1981). Weapon system and equipment support analysis (WSESA) (Draft).

¹Katzman, H., Jr. (1976). System design and documentation, an introduction to the HIPO method. Van Nostrand Reinhold Company.

2. Tailor the application and management of MIL-STD-1388A to the USAF requirements and provide guidance to adjust the MIL STD to Air Force acquisition programs.

3. Direct the handbook toward the DPMLs/ILSMs.

4. Prepare a handbook that provides guidance to the DPMLs/ILSMs relative to the integration of MIL-STD-1388A WSESA into the total acquisition process and into the system engineering process.

5. Prepare the handbook to be both an instructive device for newly assigned DPMLs/ILSMs and to provide day-to-day guidance for the DPML/ILSM in carrying out WSESA management and applications.

6. Develop the handbook content to address the life cycle of systems from pre-acquisition planning through system retirement and disposal.

7. Limit the detailed sections of the initial draft handbook to the basic acquisition phases (concept exploration, demonstration and validation, and full-scale engineering development).

8. Direct the handbook to the most recent policy expressed in Department of Defense Directive (DoDD) 5000.1, 29 March 1982, Major System Acquisitions, and to all referenced and companion directives and instructions.

9. Reflect the reviewed policy and procedural (P&P) documentation from DOD and the Air Force pertinent to acquisition and to integrated logistics support (ILS).

10. Reflect the survey findings of representative DPML/ILSM personnel at the Product Divisions of the Air Force System Command (AFSC) in the handbook content by addressing their needs, problems, opinions, and desires as potential handbook users.

11. Develop the handbook to the general requirements of MIL-STD-962, 22 September 1975, Outline of forms and instructions for the preparation of military standards and military handbooks. The draft handbook was subsequently prepared as an Air Force Pamphlet (AFP) 800-XX (Draft).

12. Select presentation techniques that permit some content flexibility, contain familiar formats, clearly present information, and structured to meet all the handbook goals.

13. Provide an informative balance of text versus graphics for the dual purposes of instructing as well as presenting guidance for any acquisition phase on programs of varying size and complexity.

14. Avoid redundant text consistent with the need to discuss naturally iterative and repetitive events. (The iterative process is applicable between phases as well as within phases, and WSESA tasks are also inherently iterative.)

15. Provide management guidance to the DPML/ILSM users of the handbook in the process of tailoring WSESA to acquisition programs for all system types, sizes, complexities, and degrees of significance.

Task 2 - Background Information

Early in the task, several Department of Defense (DOD) P&P documents were identified as having potential impact on the handbook development. The P&P documents were searched for referenced and related documents. In addition, companion Air Force documents, as well as AFSC and Air Force Logistics Command (AFLC) documents, were identified and studied. Indexes for all affected Air Force Major Commands (MAJCOMs) were searched for P&P documents that were applicable to acquisition, ILS, engineering, management, contracting, and similar functions. The Air Force assisted Westinghouse in rapidly getting the required documents so they could be reviewed and the handbook revised to properly reflect their content. A complete listing of the documents that were identified and used as part of this background research is contained in Appendix B.

Task 3 - Documentation Review

The documentation review during the first 3 months of the handbook development was a continuing process. All applicable P&P documentation pertinent to acquisition programs, engineering programs, and the incorporation of WSESA were collected, screened, reviewed, and evaluated for requirements and impacts to the handbook structure and content. Each document was carefully reviewed to identify pertinent areas and to limit the necessity for studying nonapplicable documents. Selected documents were further analyzed to determine their applicability to WSESA Logistics Support Analysis (LSA) programs, acquisition phases, and the functions that were to be addressed within the handbook.

As well as providing a key input to the handbook content, the document review findings and researchers' experience permitted the establishment of several assumptions that were underlying the book development:

1. The major acquisition guidance given by DoDD 5000.1 for major system acquisition is also applicable to other-than-major acquisitions.
2. All DOD documentation related to DoDD 5000.1 would be altered to be compatible to DoDD 5000.1, for major systems acquisition; DOD Instruction (-GO-TO-PAGE-) Major System Acquisition Process, and DoDD 5000.39, Acquisition and Management of Integrated Logistic Support for Systems and Equipment, would also be changed.
3. MIL-STD-499A (USAF) Engineering Management would be altered to include WSESA within the system engineering process.
4. All Air Force documentation applicable to WSESA and acquisition would be changed to be compatible with DoDD 5000.1.
5. All AFSC and AFLC documentation relative to acquisition and ILS would be changed to be compatible with DoDD 5000.1.
6. Additional management tasks, beyond those in MIL-STD-1388A, would be required to complete the tailoring of WSESA to Air Force requirements and to provide guidance for individual acquisition program tailoring.

Task 4 - Site Survey

The intent of the survey was to solicit experience, advice, suggestions, and recommendations from groups of representative DPMLs/ILSMs in the four AFSC Product Divisions. Numerous suggestions, based on DPML/ILSM needs and desires, were obtained. A total of four meetings were conducted at the following locations:

1. Aeronautical Systems Division, Wright-Patterson AFB, 23 June 1982.
2. Armament Division, Eglin AFB, 30 June 1982.
3. Space Division, Los Angeles Air Force Station (LAAFS), 14 July 1982.
4. Electronic Systems Division, Hanscom AFB, 21 July 1982.

AFHRL arranged for all of these Product Division meetings. This included arranging for a lead DPML/ILSM at each Division to gather the representative DPMLs/ILSMs on the appointed date and to forward copies of MIL-STD-1388A and other pertinent documents in advance of each meeting. An average of 17 personnel attended each Division meeting. Each visit was scheduled for a full day with a potential follow-on meeting during the morning of the second day if a second session was requested or needed to cover all of the topics.

AFHRL initiated each meeting with a presentation about the survey objectives, followed by an Air Force Acquisition Logistics Division (AFALD/PTA) presentation of the handbook objectives. The contractor investigators then proceeded with an open-ended presentation and a question and discussion period to solicit the potential users' comments. Overhead projector (vugraph) transparencies were employed to enhance the discussions. The discussions were based on the topical outline contained in Appendix C. This outline was used to structure the meeting to cover standard and typical topics relating to acquisition programs. Copies of the topical outline, as well as comment response forms, were distributed to attendees. These comment response forms were based on the topical outline and could be used by the attendees to record their comments.

Based on the reactions and knowledge gained from each meeting, adjustments to the individual presentation content were made. Specifically, during the first survey visit at ASD, the topical outline and comment response forms approach did not yield very active discussions. It was anticipated and suggested that "strawman" sketches of the probable handbook flow charts and task charts to the HIPO (Hierarchical-Input-Process-Output) technique could obtain more participation. This appeared to be a better technique since the topical outline containing topics relating to DoDD 5000.1 did not stimulate the DPMLs/ILSMs, who tended to think of performance problems in more practical terms.

During the second, third, and fourth visits to the Air Force Armament Division, Space Division, and Electronic Support Division, the investigators prepared vugraph films and handouts of "strawman" flow charts, task charts, and HIPO charts, and handbook outlines that were representative of the proposed handbook. Instead of the survey team obtaining advice and guidance based on the topical outline, the DPMLs/ILSMs preferred to be told what the

handbook was going to be so that they could express opinions accordingly. The topical outline provided an additional mechanism for gathering opinions. The revised approach obtained much greater participation and discussion.

The returned written comments were varied in content and ranged from voluminous to none. Many comments were delayed weeks in arriving, even after encouragement by AFHRL. Surprisingly few comments were directly related to the topical outline areas and had to be classified in these areas by the researchers. The most informative were simply narratives or short phases expressing problems or suggestions without regard to the topical outline. Most information was gathered through the investigators' recording of notes on comments made orally. Naturally, there appeared to be a general reluctance on the part of the DPMLs/ILSMs to be identified by name to a given comment that could possibly be construed as critical. Although many suggestions were directly useful to the handbook, some were beyond the intent of the draft handbook. Appendix D contains a summary of the survey findings. This summary was developed from the notes and minutes of each survey meeting (including returned written comments).

Task 5 - Handbook Development

The writing and handbook development efforts proceeded in parallel with the background data-gathering and survey activities. Some initial ideas for handbook format and contents were changed by the background analysis and survey findings, but these efforts mainly provided verification of the technical approach to the book structure and influenced some of the material content which was presented. Flexibility in the handbook content was maintained throughout all early efforts so the relevant improvements could be made to the handbook. Periodic Air Force reviews of the draft material and their participation as members of the survey team provided additional guidance for the book's development. In addition to the detailed Table of Contents included in Appendix A, the basic handbook structure is briefly described as follows:

1. Part 1 was devoted to introductory material.
2. Part 2 was planned for future use as a pre-acquisition effort covering all planning activities from mission area analysis through the Air Force and other DOD activities to the decision to acquire (acquisition program initiation) and preparation by the Air Force of the key acquisition document Program Management Directive (PMD).
3. Part 3 was devoted to DPML/ILSM procedures pertinent to the concept exploration phase of an acquisition measured from the PMD release through to the Defense System Acquisition Review Council (DSARC) and/or Air Force System Acquisition Review Council (AFSARC) Milestone I decision (as defined by DoDD 5000.1).
4. Part 4 was devoted to DPML/ILSM procedures pertinent to the demonstration and validation phase of an acquisition, measured from the DSARC/AFSARC Milestone I decision through to the DSARC/AFSARC Milestone II decision.

5. Part 5 was devoted to DPML/ILSM procedures pertinent to the full scale engineering development (FSED) phase of an acquisition measured from the DSARC/AFSARC Milestone II decision to the DSARC/AFSARC Milestone III decision.

6. Part 6 was planned for future use for the initial production and deployment stage of the production and deployment acquisition phase, measured after the DSARC/AFSARC milestone III decision.

7. Part 7 was planned for future use for the operations and support stage of the production and deployment acquisition phase, measured after the DSARC/AFSARC milestone III decision.

8. Part 8 was planned for future use for the retirement disposal stage of the production and deployment acquisition phase, measured after the DSARC/AFSARC milestone III decision, the end of a system life cycle.

9. Appendix A was devoted to a collection of (a) task text (of all WSESA tasks, subtasks and sub-subtasks), (b) task flow charts (of all tasks broken down into lower level tasks), and (c) task HIPO charts (for every task, subtask and sub-subtask). Appendix A would also support future Parts 2, 6, 7, and 8.

10. Appendix B was devoted to matrixing and listing data items relative to WSESA tasks. Appendix B would also support future Parts 2, 6, 7, and 8.

Narration of acquisition events, by phases, and discussion of WSESA task applications to events, and to the phase events was used to "talk" the DPML/ILSM through typical and standard acquisition phases and concurrent engineering and WSESA activities. For WSESA task management details, the DPML/ILSM was referred to Appendix A and, for data management details, to Appendix B. The phase-oriented narrative of events was standardized and follows a standardized "roadmap" type of flow chart. Since acquisitions are time-based programs, divided into common phases, this method appeared to be best for both instructive and guidance purposes.

Background research and knowledge of the acquisition process complexity indicated that the cookbook approach (i.e., complete step-by-step instructions) could not be taken. A cookbook for all systems at all locations would be too large to be used by the many potential users and would not be practical for wide dissemination. Instead, the handbook was written to stimulate the DPMLs/ILSMs to think through all problems in the process of tailoring WSESA to their acquisition programs and phases of interest and to formulate independent decisions. The handbook language was generic to the extent that it was applicable to a variety of systems that may be experienced by DPMLs/ILSMs in the four AFSC Product Divisions. This initial draft WSESA handbook in its standardized form and format could readily be expanded to cover the remaining acquisition stages, using similar treatments.

Task 6 - Research Report

The task activities and findings are summarized in this technical paper.

IV. RESULTS

The discussions with Air Force personnel during the four survey meetings held at the Aeronautical Systems Division, the Armament Division, the Space Division, and the Electronic Systems Division permitted a wide variety of observations. These site surveys, the background document research, and the organization process of structuring and writing the WSESA handbook surfaced many existing and potential problem areas imposing requirements on the handbook content. Since it was not possible to fully investigate all of the observations within the allocated time for completing the survey and handbook production, the findings are stated as observations and should be treated as samples of the situation that exists today. Further exploration of these samples would be needed to gather adequate statistics concerning the individual observations if any numerical analysis was to be accomplished.

The main objective for conducting the survey was to gain additional insight in structuring the handbook. This required that the information-gathering participants possess both in-depth experience in the management of WSESA and in understanding of the engineering disciplines so they could properly interpret the statements and concerns stated at the meetings. The Westinghouse and Air Force personnel who participated in these meetings were selected to provide this needed background.

A primary topic that had to be addressed was the concern that the WSESA Management Handbook be structured to provide guidance for acquisitions of both major and less-than-major systems. This presented several challenges in setting up the structure of the handbook. In particular, each acquisition phase narrative was generically developed to address the varied problems of the DPMLs/ILSMs at the different Divisions. Individual tailoring would still be required by the Product Divisions.

The survey observations showed that the problems at the individual Divisions were different and were viewed from widely varying perspectives. A summary of the program types for each Division is shown in Table 1.

Table 1. Acquisition Types of Surveyed Product Divisions

<u>Air Force Organization</u>	<u>Acquisition Types</u>
Space Division	A low quantity of major systems in size, cost, and complexity was involved.
Armament Division	Mostly small systems or equipments were involved. A large number of small systems were involved, and only one major system was addressed.
Electronic Systems Division	A low quantity of less-than-major-systems, high-cost systems, and large systems was involved.
Aeronautical Systems Division	Both major and less-than-major systems were of concern. These were characterized as high-cost, complex systems. Only moderate quantities of systems occurred at this Division.

The differing acquisitions faced by the Division were addressed in the handbook by selecting a typical, standardized, or common set of events that could be understood and used as a reference point. The individual acquisitions could then be viewed as departures from this standard pattern. The acquisition events in this typical acquisition were keyed to the pacing or driving engineering events applicable to any system, large or small. Differences were viewed as a matter of design magnitude. WSESA tasks were established at the total system level, the prime system level, the support system level, the prime elements, the support elements, and the specialized elements. The handbook written text and task descriptions maintained a consistent theme of differentiating between major and less-than-major acquisitions. By presenting material related to a typical acquisition that was keyed to engineering events, adjustments to meet the individual acquisition needs could be made. This implies that the individuals who would have to do the tailoring would have the proper training to accomplish these adjustments.

Another interesting observation was the way the various DPMLs/ILSMs felt they related to the program manager. This relationship was reported as very close to quite distant. The DPMLs/ILSMs at the Space Division seemed to be the closest to the program manager, probably because of the requirements for highly integrated systems with everything having to work together at launch. Those at the Aeronautical Systems Division were probably the next closest to the program manager because of the "critical significance" of the systems and their concern with flight safety. Those at the Electronics Systems Division seemed to be more distant from the program manager, largely because their systems were considered to be independent and could generally "stand alone." Those at the Armament Division appeared to be the most remote from the program manager, probably because their systems were not considered critical. All DPMLs/ILSMs felt that they were removed from the program manager and needed to establish better communications with the program office. In particular, it was felt that they needed to exert a much stronger influence on that office.

During the surveys of DPMLs/ILSMs at the four AFSC Product Divisions, an assertion was continually voiced that the handbook should provide help in communicating with the program manager, who is ultimately responsible for the total acquisition program. The DPMLs/ILSMs wanted guidance for negotiating with the program manager for funds and schedules and for recognition that the WSESA and ILS are significant to the program. Many DPMLs/ILSMs felt that the handbook should have been addressed to the program manager, rather than to the DPML/ILSM. Some offered the opinion that a separate small handbook should be prepared for the program manager, relative to WSESA and ILS, stressing the program manager's responsibilities.

It was also observed that training was needed at all levels. Many individuals were facing the difficult task of on-the-job learning under the added pressure of meeting requirements that were not completely understood. The DPMLs/ILSMs recognized that the WSESA (versus the older LSA) is an upgraded engineering analysis for which they needed training. Most of these personnel did not consider themselves close to engineering and felt they needed to improve communications with engineering. The continuing theme of a need for training was heard from many DPMLs/ILSMs. In fact, several felt that the WSESA Management Handbook would be a good basis for a training course. Most DPMLs/ILSMs had strong logistics orientations and were not necessarily

familiar with the engineering process and suggested that guidance to assist them in communicating with engineering personnel be included in the handbook. It was observed that several DPMLs/ILSMs had been assigned to their positions without orientation or training. Most DPMLs/ILSMs were logistics specialists by job classification. Proper training would enable the DPMLs/ILSMs to become logistics engineers with improved abilities to manage WSESA in the acquisition environment, a classification generally recognized throughout the industry. It was felt that training is needed in the following areas:

1. General management principles and methods.
2. Acquisition program management for systems and ILS.
3. General engineering orientation courses of management.
4. WSESA applications management.

All Divisions had a mix of experienced and inexperienced personnel filling the DPML/ILSM positions. Multiple program assignments were common, as well as multi-level management and professional responsibilities and tasks. As a result, the desire to have the handbook keyed to their systems in their individual Divisions was expressed. In general, the inexperienced DPMLs/ILSMs wanted to "learn" from the handbook while the more experienced saw the book as being useful to provide day-to-day management-oriented guidance. The most experienced DPMLs/ILSMs thought the handbook should not be a "cookbook," but rather should be structured to permit "thinking" and to force individual "tailoring."

Many DPMLs/ILSMs complained that their programs were started too late (delayed schedule) and with insufficient funding to meet deadlines. Many expressed the need for planning prior to the acquisition when schedule and funds for WSESA (LSA) and ILS should be programmed and included within the Air Force Program Management Directive (PMD) to which the program manager must comply. A common comment was that if WSESA/ILS is not required in the PMD, then the DPMLs/ILSMs are not directed to take action.

Many of the DPMLs/ILSMs asked for management guidance beyond the WSESA tasks defined in MIL-STD-1388A, specifically in the following areas :

1. Cost estimating (Task 105 added).
2. Request for Proposal (RFP) preparation (Task 106 added).
3. Contract preparation (Task 107 added).
4. Source selection guidance (Task 108 added).
5. Contractor performance monitoring (Task 109 added).

The added tasks were not delineated in MIL-STD-1388A but were considered necessary to meet the expressed needs of the DPMLs/ILSMs. They were developed and included in the draft handbook.

Many comments from the surveyed DPMLs/ILSMs expressed needs and desires that could not be readily addressed within the scope of the draft handbook. These findings in general were as follows:

1. They wanted detailed guidance oriented to their Product Division systems.
2. They wanted listings (for example, Statement of Work clauses) from which they could pick out complete clauses.
3. They wanted listings of standard contract clauses that would provide statements for individual contracts.
4. They wanted matrices of data items oriented to WSESA tasks so that data items could be selected without alteration.
5. They wanted complete WSESA task cost information that could be used for cost estimates.
6. They wanted a detailed "cookbook" guidance document that would simplify their tasks and compensate for a lack of training and experience.

A concern in developing the handbook was the proper reflection of the acquisition documentation and P&P documentation changes that are anticipated to take place. Although no major changes are expected that will require major alterations to the structure of the handbook or to the material content, some updating may be needed as the final documentation is released. Specifically, during the writing of the draft handbook, DoDD 5000.1, 29 March 1982, Major Systems Acquisition, was the only formally released DOD document which reflected the acquisition enhancements initiated by the Deputy Secretary of Defense Memorandum dated 15 July 1982, Year End Report on the Acquisition Improvement Program. Two other documents, DoDI 5000.2, Major System Acquisition Process, and DoDD 5000.39, Acquisition and Management of Integrated Logistic Support for Systems and Equipment, were anticipated to be changed to meet DoDD 5000.1 requirements, but were not released during the handbook development timeframe.

In addition, Air Force P&P documentation relating to DoDD 5000.1, as well as P&P documentation for acquisition in AFSC and AFLC, could also be changed as the DOD P&P documentation changes. Another document, MIL-STD-499A (USAF), 1 May 1974, Engineering Management, which requires system engineering application to acquisition programs, may also need to be changed.

The handbook development was based on current versions of MIL-STD-1388A, WSESA, and MIL-STD-XXX, WSESA Documentation, both of which were in draft form. Specifically, MIL-STD-1388A is a joint services draft document, not yet released (although release was anticipated even during the handbook development) for implementation by the military services. The draft was revised and changed during the handbook development as it was coordinated among the services. This posed minor writing problems such as terminology; for example, it was not clear whether the handbook title should be WSESA or LSA. (Since the terms are equivalent, WSESA, interchangeable with LSA, was used throughout the handbook development pending Joint Service resolution of the terminology.) MIL-STD-XXX was considered and addressed in conjunction

with MIL-STD-1388A. MIL-STD-XXX is a draft document which is a companion to MIL-STD-1388A, intended to replace MIL-STD-1388-2, 15 October 1973, Logistics Support Analysis Data Element Definition.

As the study of the background documentation research proceeded, it became apparent that many of the expected changes would not take place during the handbook development. Therefore, the content of the latest available draft documentation was used to guide the development of the draft handbook.

The complexity and scope of WSESA, which is large and comprehensive as its associated acquisition program, posed several challenges of how to address the DPMLs/ILSMs regarding WSESA, its application in all acquisition phases regardless of program size, and its integration into the system engineering process as a mainstream analysis. It was recognized that emphasis must be placed on the treatment of WSESA as an engineering analysis that impacts the system design, as well as the development of a support system. Many survey discussions showed that the potential users recognized the WSESA Management and Applications Handbook as the only guidance document that would provide for the integration of WSESA, as an engineering analysis, into the systems engineering process.

The management of data is an essential part of WSESA. This made it necessary to relate WSESA to the selection of Data Items normal to all acquisition programs. The development effort for the handbook entailed the identification of functional procedures for data (or elements of data) for the data items. In the selection of data items, consideration had to be given to all data (management, WSESA, engineering, and ILS) that would create and maintain an audit trail of data. A major consideration was that of avoiding the procurement of duplicative data. The WSESA effort, being distributed among a large number of functions (particularly engineering), required caution. ² of DPMLs/ILSMs against duplicate procurement of data, a continuing problem in acquisition programs. To provide guidance for this, the packaging of data item information into the handbook Appendix B, oriented to WSESA tasks, was felt to enhance its use as a "look-up" type of reference that was user-friendly. Previous efforts, including the AFALD/PTA Data Item Study, revealed that a great amount of common data goes into data items utilized during a WSESA program. This required cross-checking of many Data Items and their data contents to determine their commonality and to develop the handbook elements contained in Appendix B. The draft handbook was an initial attempt to organize this complex data problem.

The knowledge, experience, training, and motivations of the DPMLs/ILSMs to be visited during the survey were not known. This posed the problem of how to organize and carry out the visits in a manner suitable to gather the required data. Adjustments were made in the content of the presentations as experience was gained. The handbook developers had to carefully consider the handbook format and method of presenting the WSESA (LSA) management and application guidance for acquisition programs to an audience with varying backgrounds and responsibilities. This created questions regarding the use of text and its style, the use of graphics and their complexity, the use of appendices and their contents, and the partitioning of the handbook.

V. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based upon observations made in carrying out the background research, conducting the survey, and documenting the discoveries made while developing the handbook. They represent the accumulated observations and have been stated to serve only as a record of the findings and to provide guidance for future efforts.

Need for the Handbook. A WSESA (LSA) Management and Application Handbook is definitely needed. Nearly all personnel who participated in the survey met the idea enthusiastically and were eager to see the results after the book was developed. During the discussions, many individuals reinforced this need with their comments.

Handbook Size. The size of the handbook turned out to be greater than originally conceived but was required to satisfy requirements and refinements resulting from the survey findings. The size is a compromise to balance being sufficiently detailed to instruct, yet be useful in an everyday environment. Better trained and more experienced DPMLS/ILSMs could use a more succinct and smaller handbook. However, WSESA and the overall acquisition process are not adequately understood by most novice DPMLS/ILSMs to make a brief handbook feasible at this time. The observed unfamiliarity of the DPMLS/ILSMs with engineering also generated the need for more explanatory text in the handbook. MIL-STD-1388 is a contractual document and does not contain managerial guidance. In order to tailor the WSESA (LSA) process to Air Force requirements and to provide management emphasis for DPMLS/ILSMs, management tasks had to be added to the list of WSESA tasks already in MIL-STD-1388. This contributed to the bulk of the draft document.

Other Users. Since WSESA is an engineering analysis fully integrated into the engineering process within the acquisition program, the handbook should be valuable to the contractors as well as to DPMLS/ILSMs. The WSESA handbook is not intended to be, and cannot be, applied as a contractual requirements document; MIL-STD-1388A is the intended contractual document. The final WSESA handbook could eventually be called out as a guidance document.

Training. A definite need for improved understanding of acquisitions, the WSESA application process, engineering, and the DPML/ILSM relationships with the program manager exists. Improved communications and special courses in several areas (management, acquisitions, engineering, and WSESA applications) can perhaps improve this situation. AFHRL should review the handbook, particularly in consideration of the DPML/ILSM training needs. A majority of DPMLS/ILSMs do not have a grasp of the "big picture" of acquisitions, probably due to lack of training or exposure.

The following recommendations can allow for continuing improvement in acquisition, engineering, WSESA, and ILS for the USAF:

1. The initial draft handbook, WSESA (LSA) Management and Application Handbook, prepared as AFP 800-XX (Draft), is recommended for review by the several representative DPMLS/ILSMs in the four AFSC Product Divisions that were involved in the survey efforts. In addition, other individuals in AFSC headquarters with direct interest in acquisition, engineering, WSESA, and ILS should be included. Personnel in AFALD/PTA, as sponsors for the handbook,

should be involved in the review, as well as selected people in AFLC headquarters or other AFLC divisions and Headquarters Air Force staff. The review should be accomplished over a period of 6 to 9 months in calendar year 1983 to allow for timely inputs to be made to the final handbook.

2. It is recommended that completion of the handbook, planned as mentioned in this paper, be considered for initiation in 1983.

3. During the survey effort, numerous suggestions were made by the surveyed DPMLs/ILSMs that a concise handbook for the acquisition program manager should be prepared. It is recommended that this handbook be made compatible with the planned Part 2 of the WSESA handbook (addressing preacquisition planning activities), since similar management and staff personnel of Headquarters, AFSC, AFLC, and other MAJCOMs would be the potential Air Force users. It is suggested that a possible program manager guidance handbook and the planned Part 2 of the WSESA handbook be accomplished concurrently, since similar research functions would be involved.

4. Many of the DPMLs/ILSMs in the AFSC Product Divisions expressed a desire for an extension of the WSESA handbook to address the unique problems of each Division and the types of systems each Division handles in acquisition programs. It is recommended that, subsequent to review and upgrading of the initial WSESA handbook, selected personnel in each Product Division of AFSC could be asked to prepare Division supplements to the WSESA handbook. This method could more effectively address peculiar Division problems, thereby saving a considerable overlapping of effort that would be involved in the preparation of separate Division documents. The resulting Division supplements would be structured to track the handbook.

5. It is recommended that a future technical handbook be considered with a focus on technical implementation and applications of WSESA with an objective of standardization. The recommended technical handbook should be limited to WSESA accomplishment in the engineering environment. Since the original release of MIL-STD-1388-1/2 in October 1973 for Logistics Support Analysis (LSA), the analysis has grown in technical applications and techniques used and is still in the process of evolution. As a result, a great variety of techniques are in use. A standardized, yet flexible, technical approach to WSESA (LSA) becomes desirable in the interests of efficiency. A technical handbook for WSESA would promote standardization in both the USAF and contractor environments.

6. Some Product Division DPMLs/ILSMs suggested that the WSESA handbook could be the basis of a training course. It is recommended that, although the WSESA handbook could be a basis, related subjects, such as the following, should be added to a course:

- a. Overall acquisition objectives and methods.
- b. General engineering orientation.
- c. Common and standard management techniques and aids.

The survey revealed a need for training in these areas. If the DPMLs/ILSMs attending such a course could receive an appreciation for the total acquisition "big picture" for systems and ILS, plus an understanding of system, design, and speciality engineering influences in an acquisition, then the handbook's focus on the WSESA integration and application processes would be most beneficial.

7. Update. AFALD/PTA received 50 copies of the draft handbook in the winter of 1983. Preliminary reviews indicated some anticipated drawbacks such as size and readability. Efforts to streamline the handbook were indefinitely suspended pending reevaluation of user community requirements and the availability of other handbooks that could immediately satisfy individual program needs.

APPENDIX A
WEAPON SYSTEM and EQUIPMENT SUPPORT ANALYSIS
(LOGISTICS SUPPORT ANALYSIS)
MANAGEMENT AND APPLICATION HANDBOOK

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APPENDIX B

POLICY AND PROCEDURE DOCUMENT LISTING

This appendix contains two tables which list the Policy and Procedural (P&P) documents identified during the research and development efforts performed for the WSESA (LSA) Management and Application Handbook. Table B-1 lists those documents which were obtained and studied during the program period to determine their applicability and impact on WSESA and its management. Table B-2 contains a list of P&P documents which were identified during the course of the study effort, but which were not obtained within the contractual period.

Both tables list the documents by issuing agency and utilize the following codes to identify the document type:

- D - Directive
- H - Handbook
- I - Instruction
- M - Manual
- P - Pamphlet
- R - Regulation
- T.O. - Technical Order

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED

Office of Management and Budget Circulars

<u>Number</u>	<u>Title</u>
A-76	Procedures for Acquiring Commercial or Industrial Products and Services for Government Use
A-109	Major System Acquisition

Defense Acquisition Regulations (DAR)/Armed Services Procurement Regulations (ASPR)

<u>Number</u>	<u>Title</u>
1-406	Contract Administration Functions
1-2100	Procurement Planning
3-501	Preparation of Request for Proposals or Request for Quotations
3-701	Definitions, Negotiated Overhead Rates
3-901	Scope, Make-or-Buy Programs Policies or Procedures
3-1201	General, Cost Accounting Standards
7-104	Contract Clauses to be Used When Applicable
9-200	Rights in Technical Data and Copyrights
9-500	Acquisition of Technical Data and Computer Software

Department of Defense

<u>Number</u>	<u>Title</u>
DoD 4105.59H	Direct Contract Administrative Services
DoDD 4105.55	Selection and Acquisition of Automatic Data Processing Resources
DoDD 4120.21	Specifications and Standards Application
DoDM 4140.26M	Integrated Material Management of Consumable Items
DoDI 4140.41	Government-Owned Material Assets Utilized as Government Furnished Material for Major Acquisition Programs

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
DoDI 4151.12	Policies Governing Maintenance Engineering within DoD
DoDD 4151.16	DoD Equipment Maintenance Program
DoDD 5000.1	Major System Acquisitions
DoDI 5000.2	Major System Acquisition Process
DoDD 5000.3	Test and Evaluation
DoDD 5000.4	OSD Cost Analysis Improvement Group
DoDD 5000.19	Policies for the Management and Control of Information Requirements
DoDD 5000.28	Design to Cost
DoDD 5000.29	Management of Computer Resources in Major Defense Systems
DoDD 5000.39	Acquisition and Management of Integrated Logistic Support for Systems and Equipment
DoDD 5000.40	Reliability and Maintainability
DoDD 5010.16C	Defense Management Education and Training Program
DoDD 5025.1	Department of Defense Directives System
DoDD 7000.1	Resource Management Systems of the Department of Defense
DoDI 7000.3	Selected Acquisition Reports
DoDI 7000.10	Contract Cost Performance, Funds Status and Cost/Schedule Status Report

Military Specifications

<u>Number</u>	<u>Title</u>
D-1000B	Drawings, Engineering and Associated Lists
T-5422F	Testing, Environmental, Aircraft Electrical Equipment
M-7298C	Manual, Technical, Commercial Equipment
N-7384C	Preparation of Contractor Furnished Equipment Notices

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
L-8031D	List of Applicable Publications
P-9024G	Packaging, Handling, and Transportation in System/ Equipment Acquisition
M-9858A	Quality Program Requirements
M-9994	Manual, Technical, Operation and Maintenance Instruc- tions (For Mobile Training Sets and Part Task Trainers)
M-24100B	Manual, Technical, Functionally Oriented Maintenance Manuals For Equipment and Systems
D-26239A	Qualitative and Quantitative Personnel Requirements Information Data
M-38717B	Manual, Technical, Work Unit Code (For Ground Communi- cations Electronics Meteorological Equipment)
M-38784A	Manuals Technical: General Style and Format Requirements
P-38790A	Printing Production of Technical Manuals, General Requirements for
M-38800A	Manual, Technical, Organizational, Maintenance Instructions
M-38807	Manual, Technical, Illustrated Parts Breakdown, Preparation of
D-26239A	Data, Qualitative and Quantitative Personnel Requirements Information
C-45662A	Calibration System Requirements
H-46855B	Human Engineering Requirements for Military Systems, Equipment and Facilities
S-52779A	Software Quality Assurance Program
T-81821	Trainers, Maintenance Equipment and Services, General Specification for
S-83490	Specifications, Types and Forms
M-83495	Manual, Technical, Organizational Maintenance Manual Set, General Requirements for Preparation of

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
Military Standards	
100C	Engineering Drawing Practices
129H	Marking for Shipment and Storage
130L	Identification Marking of U.S. Military Property
155A	Joint Photographic Type Designation System
196C	Joint Electronics Type Designation System
470	Maintainability Program Requirements
480A	Configuration Control - Engineering Changes and Waivers
481	Configuration Control-Engineering Changes, Deviations and Waivers
482	Configuration Status Accounting Data Elements and Related Features
483 (USAF)	Configuration Management Practices for Systems, Equipment Munitions, and Computer Programs
490	Specification Practices
499A (USAF)	Engineering Management
680A	Contractor Standardization Program Requirements
721C	Definition of Effectiveness Terms for Reliability, Maintainability, Human Factors and Safety
726F	Packaging Requirements Code
756B	Reliability Modeling and Predictions
757	
785	Reliability Program for Systems and Equipment Development and Production
789B	Procurement Method Coding of Replenishment Spare Parts
794D	Part and Equipment, Procedures for Packaging and Packing of

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
831	Test Reports
834	Packaging Data Forms, Instructions for Preparation and Use
864	Support Equipment Functional Classification Categories
875A	Type Designation System for Aeronautical and Support Equipment
881A	Work Breakdown Structure for Defense Material Items
882A	System Safety Program Requirements
885B	Procurement Data Packages
965	Parts Control Program
1366B	Material Transportation System Dimensional and Weight Constraints, Definition of
1367	Packaging, Handling, Storage, and Transportability Program for Systems and Equipments
1369	Integrated Logistics Support Program Requirements (Use MIL-STD-1388-I)
1379B	Contract Training Programs
1388-1/2	Logistics Support Analysis
1388A	Weapon System and Equipment Support Analysis
1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities
1510A	Container Design Retrieval System, Procedures for Use of
1513	Trade Studies for the Selection of Avionics Test Support Systems, Criteria for
1517	Phased Provisioning
1519	Test Requirements Document, Preparation of
1520B	Corrective Action and Disposition System for Non-conforming Material

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
1521A	Technical Reviews and Audits for Systems, Equipments, and Computer Programs
1528	Production Management
1535A	Supplier Quality Assurance Program
1538	Spare Parts and Maintenance Support of Space and Missile Systems Undergoing RDT&E
1540A	Test Requirements for Space Vehicles
1543	Reliability Program Requirements for Space and Missile Systems
1545	Optional Spare Parts, Maintenance and Inventory Support of Space and Missile Systems
1546	Part, Materials, & Processes Standardization, Control and Management Program for Spacecraft and Launch Vehicles
1552A	Provisioning Technical Documentation, Uniform Department of Defense Requirements for
1553A	Aircraft Internal Line Division Command/Response Multiplex Data Bus
1556A	Government/Industry Data Exchange Program, Contractor Participation Requirements
1561A	Provisioning Procedures, Uniform DoD
1577	Intercontinental Ballistic Missile System Training Equipment Management
1589A	JOVIAL (J-73)
1591	On Aircraft Fault Diagnosis, Subsystems, Analysis/Synthesis of
1629A	Procedures for Performing a Failure Mode, Effects and Criticality Analysis
1750A	Airborne Computer Instructions Set Architecture
1760	Aircraft/Store Electrical Interconnection System

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
45662	Calibration Systems Requirements
XXX	Weapon System and Equipment Support Analysis Documentation
Military Handbooks	
300L	Support Equipment
331B	Military Standardization Handbook, Directory of DoD Engineering Data Repositories
U.S. Air Force	
AFR 8-2	Air Force Technical Order System
AFR 18-1	Air Force Energy Conservation Management
AFR 23-36	Air Force Test and Evaluation Center
AFR 25-5	Air Force Management Engineering Program
AFR 26-2	Organization Policy and Guidance
AFR 40-411	Employee Training and Development
AFM 50-5	USAF Formal Schools Catalog
AFR 50-8	Instructional System Development
AFR 50-9	Special Training
AFR 50-11	Management and Utilization of Training Devices
AFM 55-43	Management of Operational Test and Evaluation
AFR 57-1	Statement of Operational Need
AFR 57-4	Modification Program Approval
AFR 57-6	DoD High Dollar Spare Parts Breakout Program
AFR 65-2	Provisioning of End Items of Material
AFM 66-1	Maintenance Management
AFR 66-1	Maintenance Management
AFR 66-7	Depot Level Maintenance Production

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
AFR 66-12	Aircraft and Missile Equipment Accountability
AFR 66-14	Equipment Maintenance Policies, Objectives and Responsibilities
AFR 66-30	Product Improvement Policy for Operational Equipment
AFR 67-7	Processing Discrepancy Reports Against Foreign Military Sales Shipments
AFR 67-19	Logistics Support of Research, Development, Test and Evaluation Activities
AFR 67-47	Phased Provisioning
AFR 71-1	Packaging Management
AFR 73-1	Defense Standardization and Specification Program
AFR 73-3	Standardization and Interoperability of Weapons Systems and Equipment in the North Atlantic Treaty Organization
AFR 74-1	Quality Assurance Program
AFR 74-2	Air Force Metrology and Calibration Program
AFR 74-6	Reporting of Quality Deficiencies Across Component Lines
AFR 75-1	Transportation of Material
AFR 75-2	Military Traffic Management Regulation
AFR 75-43	Transportation of Foreign Military Sales Material
AFR 80-3	Management of Research and Development in Air Force Laboratories
AFR 30-5	Air Force Reliability and Maintainability Program
AFR 30-14	Test and Evaluation
AFR 30-33	Management of Air Force Survivability Program
AFR 86-1	Programming Civil Engineer Resources
AFR 39-1	Design and Construction Management

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
AFR 100-18	USAF Ground Communications - Electronics Planning and Program Management
AFR 170-3	Financial Management of the Security Assistance Program
AFM 172-1	USAF Budget Manual
AFR 300-2	Managing the USAF Automatic Data Processing Program
AFR 310-1	Management of Contractor Data
AFR 400-6	Maintenance Engineering and Logistics Support for the Security Assistance Program
AFR 400-19	Security Assistance Program, Ground Communications
AFR 800-2	Acquisition Program Management
AFR 800-3	Engineering for Defense Systems
AFR 800-4	Transfer of Program Management Responsibilities
AFR 800-5	Selected Acquisition Reports
AFR 800-6	Program Control - Financial
AFR 800-7	Integrated Logistics Support Implementation Guide for DoD Systems and Equipment
AFR 800-8	Integrated Logistics Support Program
AFR 800-10	Management of Multiservice and Agency Systems, Programs and Projects
AFR 800-11	Life cycle Cost Management Program
AFR 800-12	Acquisition of Support Equipment
AFR 800-13	Air Force Feedback Program
AFR 800-15	Human Factors Engineering and Management
AFR 800-22	CFE vs. GFE Selection Process
AFR 800-26	Spares Acquisition Integrated with Production
AFR 800-27	Development and Use of Non-Government Specifications and Standards

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
AFR 800-28	Air Force Policy on Avionics Acquisition and Support
AFR 800-29	Application of Specialized Management
U.S. Air Force Technical Orders (T.O.)	
T.O. 00-20-4	Configuration Management Systems
T.O. 00-20-14	Air Force Metrology and Calibration Program
Joint Regulations, Air Force Systems/Logistics Commands	
AFSC/LCR 66-24	Maintenance of Aerospace Vehicles and Related Support Equipment
AFSC/LCR 800-2	Management of Multiservice Systems, Programs and Projects
AFSC/LCR 800-4	Optimum Repair Level Analysis
AFSC/LCR 800-5	AGE Acquisition Management
AFSC/LCR 800-24	Standard Integrated Support Management System
AFSC/LCR 800-30	Depot Maintenance Interservice
AFSC/LCR 800-31	GFE/CFE Selection Process, GFE Acquisition and GFE Management
AFSC/LCR 800-34	Acquisition Logistics Management
AFSC/LCR 800-36	Logistics Support Analysis
AFSCR 27-1	Program Direction
AFSCR 70-7	AFSC Solicitation Review Panel
AFSCR 74-1	Quality Assurance Program
AFSCR 80-15	Source Selection Policy and Guidance
AFSR 310-1	Management of Contractor Data
AFSCM 310-2	Technical Publications Acquisition Management
AFSCR 400-2	Logistics Support for Test and Evaluation
AFSCP 800-7	Configuration Management

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
AFSC Supplement 1 to AFR 800-15	Human Factors Engineering and Management
Air Force Logistics Command (AFLC)	
AFLCR 27-3	The AFLC Program Objective Memorandum
AFLCR 57-21	Modification Program Approval
AFLCR 57-27	Initial Requirements Determination
AFLCR 66-15	Product Performance
AFLCR 66-17	Depot Maintenance Support Planning
AFLCR 66-37	Management of Automated Test Systems
AFLCR 66-75	Depot Maintenance Source of Repair Decision Tree Analysis Reporting Procedures for Contractors
AFLCR 67-2	USAF Equipment Allowance System
AFLCR 67-14	USAF Equipment Allowance Management Program
AFLCR 80-4	Test and Evaluation
AFLCR 310-1	Acquisition Management of Contractor Data
AFLCR 400-1	Logistics Management Policy
AFLCR 800-9	Management of DPML/ILSO's
AFLC Supplement 1 to AFR 800-6	Program Control-Financial
Air Force Acquisition Logistics Division	
None	Logistics Support Analysis Guide (Issued by Office Symbol PTA)
AFALDP 70-1	RFQ's and Contract Preparation Guide for Acquisition Logistics

TABLE B-1. LISTING OF DOCUMENTS OBTAINED AND STUDIED (Continued)

<u>Number</u>	<u>Title</u>
U.S. Army Document	
DA-P-750-40	Reliability Centered Maintenance Procedures
DARCOM-H-700-3.1-82	LSA Techniques Guide
DARCOM-P-750-16	Logistics Support Analysis Guide

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED

<u>Number</u>	<u>Title</u>
Department of Defense	
DoDD 2010.6	Standardization and Interoperability of Weapons Systems and Equipment Within the North Atlantic Treaty Organization
DoDD 3224.1	Engineering for Transportability
DoDI 4105.59	Plant Cognizance Program
DoDI 4105.64	Technical Representation at Contractor's Facilities
DoDD 4120.3	Department of Defense Standardization Program
DoDM 4145.26	DoD Contractor's Safety Manual for Ammunition, Explosives
DoDD 5000.11	Data Elements and Data Codes Standardization Program
DoDD 5000.35	Defense Acquisition Regulatory System
DoDD 5010.12	Management of Technical Data
DoDD 5010.20	Work Breakdown Structures for Defense Material Items
DoDD 5105.38	Defense Security Assistance Agency
DoDI 7000.2	Performance Measurement for Selected Acquisitions
DoDI 7000.11	Contractor Cost Data Reporting

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED (Continued)

<u>Number</u>	<u>Title</u>
U.S. Air Force	
AFR 23-8	Air Force Systems Command
AFM 26-1	Manpower Policies and Procedures
AFR 26-1	Manpower Policies and Procedures
AFR 39-1	Airman Classification Regulation
AFR 55-22	Contractors Flight Operations
AFR 55-31	Requests to Locate on or Survey Installations in CONUS, Alaska and Hawaii, and Territorial Areas Administered by the United States
AFR 65-3	Configuration Management
AFM 66-18	Engineering and Technical Services Management and Control
AFR 66-45	Joint Regulation Governing the Use and Application of Uniform Source, Maintenance and Recoverability Codes
AFM 67-1	USAF Supply Manual
AFR 70-15	Source Selection Policy and Procedures
AFR 73-2	Communications - Electronics Standard-Facility Equipment Lists
AFR 73-6	International Military Standardization Program
AFR 74-18	Quality Assurance Program During Acquisition
AFM 78-4	Priorities and Allocations
AFR 80-18	Department of Defense Engineering for Transportability
AFR 80-44	Defense Technical Information Center
AFR 80-45	Distribution Statements on Technical Documents
AFR 86-6	Air Base Master Planning Manual
AFM 88-2	Air Force Design Manual, Definitive Designs of Air Force Structures

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED (Continued)

<u>Number</u>	<u>Title</u>
AFM 88-15	Air Force Design Manual - Criteria and Standards for Air Force Construction
AFM 100-19	USAF Ground Communications - Electronics Program Implementation Management
AFM 127-100	Explosive Safety Standards
AFP 172-4	The Air Force Budget
AFR 172-13	Programming and Financing of Joint Use Facilities
AFR 173-1	The Air Force Cost Analysis Program
AFP 177-2	Management Handbook for Accounting and Finance Officers
AFR 177-112	International Accounting Transactions
AFR 300-4	Standard Data Elements and Codes - General Instructions
AFR 300-12	Procedures for Managing Automated Data Processing Systems
AFR 300-15	Automatic Data System Project Management
AFM 400-2	Air Force Logistics Doctrine
AFR 400-3	Foreign Military Scales
AFR 400-10	Procedures in Support of the DoD Strategic Trade Control Program
AFR 400-26	Logistics Support for Ground Communications - Electronics Systems and Equipment
AFR 400-30	The Air Force Logistics Career Broadening Program
AFR 400-60	Administration of Military Standard Logistics Systems
AFR 400-63	USAF Logistics Support Priorities Managing USAF Logistics Resources
AFR 400-64	Logistics Support Plans for Ground C-E Systems and Equipment
AFR 400-41	Logistics Support of Missile System Oriented Fixed Installed Support Equipment

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED (Continued)

<u>Number</u>	<u>Title</u>
AFR 800-9	Manufacturing Management for Air Force Acquisitions
AFR 800-17	Work Breakdown Structure (WBS) for Defense Material Items
AFR 800-18	Reliability and Maintainability
AFR 800-19	System or Equipment Turnover
AFR 800-20	Defective Parts and Components Control Program
AFR 800-21	Interim Contractor Support for Systems and Equipment
AFR 800-30	Life Cycle Management of Aeronautical Gas Turbine Engines
AFR 800-31	Uniform Clothing Items
AFSC/LCR 66-36	
AFSC/LCR 67-17	
AFSC/LCR 67-20	
Joint Regulations, Air Force Systems/Logistics Commands	
AFSC/LCR 57-3	Class V Modification Management
AFSC/LCP 173-3	Cost/Schedule Management of Non-Major Contracts
AFSC/LCP 173-5	Cost/Schedule Control Systems Criteria
AFSC/LCP 173-6	C/SCSC Joint Surveillance Guide
AFSC/LCR 310-2	Deferred Requisitioning of Engineering Data
AFSC/LCR 400-42	Foreign Military Sales Lessons Learned
AFSC/LCR 800-11	Site Activation/Alteration Task Forces
AFSC/LCP 800-19	Joint Design-to-Cost Guide Life Cycle Cost as a Design Parameter
AFSC/LCR 800-28	Repair Level Analysis Program
AFSC/LCR 800-29	Policies and Procedures for Hazardous Materials Package Certification

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED (Continued)

<u>Number</u>	<u>Title</u>
AFSC/LC Supplement 1 to AFR 800-4	Transfer of Program Management Responsibility
AFSC/LC Supplement 1 to AFR 800-8	Integrated Logistics Support Program
AFSC/LC Supplement 1 to AFR 800-11	Life Cycle Cost Management Program
Air Force Systems Command	
AFSCR 66-5	System Effectiveness Data System Recording Procedures
AFSCR 67-6	Authorization and Control of RDT&E Equipment Allowance Source Codes
AFSCR 67-7	Excess Non-NSN RDT&E Equipment
AFSCR 70-2	AFSC Business Strategy Panel
AFSCR 74-2	Quality Assurance Program for Centers and Ranges
AFSCR 75-1	Systems and Procurement Transportation
AFSCP 80-3	Guide for Vanguard Planning
AFSCP 80-5	Guide for Advanced Development
AFSCR 80-14	Test and Evaluation
AFSCR 80-20	AFSC Technical Report Program
AFSCR 84-2	Production Readiness Review
AFSCM 84-3	Production Management
AFSCR 100-4	Communications - Electronics Staff Office
AFSCM 172-1	USAF Budget Manual
AFSCR 173-2	Confidence Levels of Cost Estimates
AFSCR 177-1	Foreign Military Sales
AFSCP 800-3	A Guide for Program Management

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED (Continued)

<u>Number</u>	<u>Title</u>
AFSC Supplement 1 to AFR 70-15	Source Selection Policy and Procedures
AFSC Supplement 1 to AFR 80-5	Air Force Reliability and Maintainability Program
AFSC Supplement 1 to AFR 800-2	Program Management
AFSC Supplement 1 to AFR 800-6	Program Control-Financial
Air Force Logistics Command (AFLC)	
AFLCM 57-2	Computation of Requirements for Equipment Type Items
AFLCR 57-4	Recoverable Item Requirements System
AFLCP 57-13	Recoverable Inventory Control Using MOD-METRIC
AFLCR 65-1	Master Material Support Record
AFLCR 65-5	Air Force Provisioning Policies and Procedures
AFLCR 65-14	Depot Maintenance Interservice Support
ALFCM 66-14	AF Technical Order System Data Operations
AFLCR 67-7	Stock Fund Initial Spares Requirements
AFLCR 71-1	AFLC Packaging and Materials Handling Policies and Procedures
AFLCR 80-3	Engineering Planning and Programming
AFLCM 172-1	Budget, Policy and Procedures and Estimating Instructions
AFLCM 177-1	Policies and Procedures
AFLCR 523-1	Mission Assignment Policy
AFLCR 523-3	AFLC Mission Assignments
AFLCM 800-1	Program Management
AFLCR 800-21	Management and Support Procedures for Computer Resources Used in Defense Systems

TABLE B-2. LISTING OF DOCUMENTS IDENTIFIED BUT NOT OBTAINED (Continued)

<u>Number</u>	<u>Title</u>
AFLC Supplement 1 to AFR 400-3	Foreign Military Sales
AFLC Supplement 1 to AFR 800-2	Acquisition Program Management
Air Force Test and Evaluation Center (AFTEC)	
AFTECR 55-1	AFTEC Operations
AFTECP 400-1	Logistics Assessments

APPENDIX C

TOPICAL OUTLINE

This Topical Outline was prepared for use during the survey visits to the different divisions. The topics were derived from DoD/USAF Policy and Procedural documentation applicable to acquisition programs. The intent of the topical outline was to gather together all comments, suggestions, criticisms, and suggestions by DPML/ILSMs, under a common set of topics to be used as a guide in formulating the elements of the WSESA handbook.

I. ACQUISITION PROGRAM CHARACTERISTICS IMPACTING WSESA

- A. Major System Acquisition
 - 1. USAF Single Service System Program
 - 2. USAF Lead/Follow Joint Service System Program
 - 3. USAF/Multinational (NATO) System Program
- B. Other-Than-Major System Acquisition
 - 1. USAF System Program
 - 2. USAF Sub-System Program
 - 3. USAF Set/Equipment Program
- C. General Acquisition Considerations
 - 1. System Engineering Program
 - 2. Standardization Program
 - 3. DTC/DTLCC/LCC Program
 - 4. Test and Evaluation Program
 - 5. Commercial Items/Sources Use
 - 6. Sole Sources
 - 7. Non-Profit/Research/Government Institutions
 - 8. Product Improvement Program (PIP)
 - 9. Pre-Planned Product Improvement (P³3OI)
 - 10. NATO Rationalization, Standardization and Inter-operability (RSI)
 - 11. Reliability and Maintainability (R&M) Program
 - 12. GFE/CFE Applications
 - 13. Cost Schedule Control System (CS²20) Application
 - 14. Configuration Management Program
 - 15. Computer Resources Program

II. PLANNING, BUDGETING AND FUNDING

- A. Planning and Programming
 - 1. WSESA Tasks (Work)
 - 2. WSESA Schedule (Time)
 - 3. WSESA Integration (Tasks/Schedule Allocation)
- B. Cost Estimating (WSESA Program)
 - 1. Labor Costs
 - 2. Task Time Spans
 - 3. Related Costs
- C. Budgeting
 - 1. Budget Scope Definition
 - 2. Budget Submittal
 - 3. Budgetary Process Monitoring

- D. Funding
 - 1. Scope of Funds
 - 2. Funding Times
 - 3. Funding Allocation/Distribution

III. WSESA/ILS STRATEGY INCORPORATION INTO PMD/PMP

- A. Phased WSESA Supportability Objectives/Constraints
- B. Phased WSESA Milestones Timing
- C. WSESA Plan
- D. ILS Plan
- E. Plans Integration/Compatibility

IV. WSESA "SINGLE ANALYSIS" SOURCE OF SUPPORTABILITY DATA

- A. Source of Supportability Requirements for System Design
- B. Source of Criteria for ILS Planning
- C. Source of Data for Tradeoff Studies
- D. Source for Determination of ILS Resources
- E. Strategy for WSESA Application
- F. WSESA Integration/Schedule Definition
- G. CDRL Preparation
- H. CWBS Application
- I. USAF Supplied Data/Information/Responsibilities
- J. Application of Supportability Requirements in System Specification

V. WSESA PROCESS

- A. WSESA Tasks and Milestones Identification
 - 1. Keyed to System Events, Tasks and Milestones
 - 2. Hierarchical Task Structure
 - 3. Compatible to MIL-STD-1388A Tasks
 - 4. Compatible to WBS/CWBS/LSACN/WUC
 - 5. Tailorable to Acquisition Program Unique Characteristics
 - 6. Definable Performance, Schedule, Cost
- B. Identification of Data Items
 - 1. Selection of Standard Data Items
 - 2. Modification of Standard Data Items
 - 3. Unique or Added Data or Data Items
 - 4. Screening of Data/Data Items Redundancy Avoidance
 - 5. Timing/Schedule of Data Items
- C. RFP Preparations
 - 1. Proposal Instructions for WSESA Program
 - 2. Application of WSESA (LSA) Record/ADP System
 - 3. SOW Preparation/Task Definition
 - 4. CDRL Preparation
- D. Contractor Source Selection
 - 1. Establishment of Source Selection Criteria
 - 2. Proposal Review
 - 3. Proposal Weighting and Tradeoffs
 - 4. WSESA/ILS Program Evaluation
 - 5. WSESA Impact Evaluation

- E. Contractor Performance Monitoring
 - 1. Establishment of Monitoring Criteria for WSESA/ILS
 - 2. Meetings and Reviews/Performance Control
 - 3. Task Flow/Schedule Adjustment
 - 4. Data Flow/Deliveries
 - 5. Cost Control/Cost Adjustment
 - 6. Integrating Multiple/Competing Contractors
 - 7. USAF Responsibilities/Data/Information
 - 8. WSESA Decisions. Task Performance/Redefinition
 - 9. WSESA Impacts on System Design/ILS Program
 - 10. Validation and Testing of WSESA Data

APPENDIX D

SUMMARY OF SURVEY FINDINGS

The site surveys were utilized to solicit comments, discussions, and questions regarding the Topical Outline and "strawman" handbook features. During each site survey meeting, notes were taken and minutes of each meeting were recorded by the investigators. Additionally, each attendee was given a blank comment form, based on the topical outline, on which to make written comments. The results gathered from these survey visits have been summarized and categorized below in terms of the Topical Outline and user needs/desires. A listing of five documents identified during the surveys has also been included.

Comments are arranged under the major headings of the topical outline. Brief summary statements reflecting the content of the comments are included. The total number of comments received in each topic area is shown to the right of the topic.

Survey Content Comments Related To Topical Outline

<u>Topical Outline Subject</u>	<u>Total Number of Comments Received</u>
I. ACQUISITION PROGRAM CHARACTERISTICS IMPACTING WSESA	
A. Major System Acquisitions	5
<ul style="list-style-type: none">Not all multinational/NATO acquisition programs are classified as major.Space Division had all major acquisitions, ASD a mix, AD one major program and ESD none.	
B. Other-Than Major System Acquisition	11
<ul style="list-style-type: none">Justification of application of LSA.Requested tailoring guide or critical path networks.	
C. General Acquisition Considerations	18
<ul style="list-style-type: none">Programs don't normally fit the classical phase.No such thing as a generic program.Lack of management continuity introduces acquisition problems.Many short (3-18 month) programs.	

- How to apply LSA to programs that don't deliver hardware, but a specification?
- How to apply LSA to a program when the equipment is contractor supported?
- How to plan/manage overlapping or concurrent programs?
- How to tie program phases together?
- How to manage small or item programs that lag weapons systems development?
- In-house or other government agencies produce prototypes with no logistics requirements defined, and production phase must be awarded.
- Software impacts.
 - Need to educate logisticians on software requirements
 - Incorporate AFLC/LOE policy on CPINs, CPCIs
 - List software requirements on task sheets
 - Address waivers for Higher Order Language (HOL)
 - Impact of software maintenance concept and required support data
- Address military construction program-long lead time for facilities and data availability.

II. PLANNING, BUDGETING AND FUNDING

A. Planning and Programming

1. General

23

- Address CSCS, etc. and others.
- How to identify LSA problems?
- How to tie program phases together?
- How best to get LSA requirements into RFP/SOW?
- Identification and selection of LSA work packages/tasks.

- Timing and selection of data items.
 - How to plan/budget/fund small programs that lag weapons system development?
 - If applicable - use of open ended contract requirements (pay for when ordered).
 - If not going to use LSA to support program, don't require LSA or associated studies.
 - Provide checklists.
 - Provide flowcharts and critical path networks.
2. LSA Data not Available 3
- What action should be taken if no LSA data available from previous phase?
 - If data delivery milestones are missed, what can be done to plug hole, work around, etc.?
3. Late Starts 6
- How to start at an intermediate point?
 - How to plan for small/item programs which lag major weapon system acquisition?
4. Overlapping/Concurrent Program Phases 4
- Creates data acquisition problems.
 - Creates data flow problems.
 - Provide guidance in handbook.
5. Support Planning 6
- Contractor vs. organic - how to evaluate (trade-off criteria).
 - Preoperational Support
 - Consider Interim Contractor Support (ICS).
 - Address in handbook.

6. Military Construction Program 3
- Serious problem getting facilities data from Corps of Engineers.
 - Separate category of vendor data.
 - Ensure data requirements on CDRL.
- B. Cost Estimating 9
- Provide Cost Estimating Relationships (CERs).
 - Provide information to determine costs of LSA.
 - Provide break-even curves.
 - Possibly include a 100 series task (future task 105?).
 - LSA
 - LCC link
 - Often overlooked.
 - Use for front-end analyses.
 - Enter data into LSAR.
 - Use real-world R&M numbers, etc.
- C. Budgeting 9
- ILS = 10 to 15% of acquisition program cost, LSA = 60% of ILS Program cost.
 - How to budget for small/item programs that lag weapons systems development?
 - Address computer resources support purchased out of program monies.
 - Use of cost data available from controllers office at each command for cost estimating.
- D. Funding 2
- How to fund late start and lagging programs?
 - How to determine adequacy of funding allocated to LSA?

III. WSESA/ILS STRATEGY INCORPORATION INTO PMP/PMD

6

- PMD should stress importance of LSA requirements and strategy.
- Need device to convey to Air Staff the need for LSA direction in PMP/PMD.
- Use real-world R&M numbers and other factors when modeling to insure preparation of realistic plans.
- PMD should require LSA integration and require preparation of LSA Plan.

IV. WSESA "SINGLE ANALYSIS" SOURCE OF SUPPORTABILITY DATA

4

- Provide LSA sales tool to convince Program Manager of worth.
- Use same data (such as R&M values) for all modeling and analyses.
- Who is source of data, and how does USAF verify inputs?

V. WSESA PROCESS

A. WSESA Tasks and Milestone Identification

22

- Possible to include a task addressing costing (future task 105?).
- Flow charts to depict interrelationships between LSA and development of logistics (ILS) support elements.
- Address all 15 ILS elements (refer to AFR 800-8).
- Provide information to determine supportability impacts of LSA.
- Provide a tailoring guide or critical path flow to aid in task selection.
- Provide a list of LSA related tools (analyses, models, etc.).
- Depict flows between subtasks or task charts.
- Provide checklists.
- Methods of identifying/coordinating program requirements such as FMECA.

- Use of MIL-STD-1388A on existing contracts invoking MIL-STD-1388-1 & 2.
- Emphasize iterative design feedback process.
- Key flow charts to design process.
- Depict software development milestones.
- Provide tailoring guidance.

B. Identification of Data Items

17

- Provide matrix - output summaries vs. DID.
- Recommendations for selection of deliverables.
- Place data matrix on task charts.
- Justification for LSA to produce required data.
- Correlation between data base and DID data.
- Address software DIDs.
- Possible to use new MIL-STD-1388A DIDs that are unnumbered.
- Include cautions on duplication of data.
- Ensure that Military Construction Program Data requirements are on CDRL.

C. RFP Preparation

7

- How to select tasks, prepare RFP, SOW, CDRL and other contractual documents. (Future tasks 106 and 107?)
- Use of LSA plan:
 - as a mainstream contractual document
 - tie together LSA, RLA, LCC
 - as an independent document
 - to sell LSA to program managers.
- Have contractor prepare flow chart depicting LSA process.

- LSA requirements for commercial equipment.
 - little or no LSA data
 - guidelines for application.

D. Contractor Source Selection

12

- Guidelines for evaluation of proposed LSA efforts and management structure.
- Guidelines for evaluation of contractors cost estimates. (Future task 108?)
- Evaluation of proposed timing of data submittals.
- Criteria for evaluation of proposals dealing with modified and unmodified commercial off-the-shelf equipment.

E. Contractor Performance Monitoring

3

- Guidelines for evaluation of data submitted and funds expended. (Future task 109?)
- Address WSESA (LSA) review team concept and provide specifics where possible.
- Refer also to topic III-A "Planning and Programming" above.

User Needs/Desires

<u>Subject</u>	<u>Number of Comments</u>
I. HANDBOOK FORMAT, CONTENT, ETC.	59
- Don't tie to aircraft terminology, use generic terms.	
- Approach useful, flow chart hard to follow, but best known approach.	
- Future task 105 relative to costing.	
- Useful as guide and instructive device for PM/DPML/ILSM.	
- Justification of LSA in POM process.	
- Flow charts depicting interrelationships between LSA and development of Logistics Support Elements.	
- Present decision trees for DPML/ILSM.	
- Expand task flow chart to show ILS and task interrelationships.	
- How to identify LSA problems?	
- How best to get LSA requirements into RFP/SOW?	
- Need for an executive summary to give overview of handbook.	
- Chapter to present summary for middle level managers.	
- Use case studies/examples.	
- Provide info to determine costs, supportability impacts, etc. of LSA.	
- Address all 15 ILS elements per AFR 800-8.	
- Provide tailoring guide for small programs or critical path flow.	
- Incorporate PTA guide material into handbook.	
- Provide DID information on task sheets or possibly a cross-reference matrix.	
- Tools-list of LSA related (analyses, models, etc.).	

- Stimulate user to think about and effectively plan his program.
- Depict flows between subtasks on task charts.
- Provide checklists.
- Provide sample RFP, SOWs, etc.
- Methods of identifying/coordinating program requirements such as FMECA.
- Use of 1388A tasks on old contracts invoking 1388-1 & 2.

II. LSA EFFORT INTEGRATION

8

- How to integrate contractor and/or subcontractor efforts (strong SOW & CDRL)?
- Interrelationships between contractors/subcontractors/etc.
- Govt./Contractor interfaces.
- How do you get PM to integrate LSA efforts?
- PMD should require LSA integration.
- Address communications with other DPML/ILSMs, System SPOs, AFALD/XR (publications, DIDs, etc.), ALCs, ASD, and contractors.
- Second source strategies/lead or follow contractors.
- Accomplish some supportability demos during validation phase.

III. DPML/ILSM/USER BACKGROUND, ETC.

13

- Many have little experience in LSA.
- Resources for implementing LSA are limited.
- Many only manage part of ILS/LSA program.
- Definition/duties are not standard between commands.
- Acceptance and use by PM/DPML/ILSM is a key issue.
- Often 3 to 6 layers of management between small program DPML/ILSM and PM.
- Provide LSA sales tool (convince PM of worth).

- Provide guidance on responsibilities.
 - o Types of govt. furnished input data.
 - o Required LSA outputs.
- Alert PM to reliability degradation.
- Alert PM - use single database for all program decisions.
- Many have two or more programs and service all ILS functions.

IV. LSA TRAINING

6

- Handbook could be used as outline for AFIT course.
- Handbook would be useful for self-instruction - please provide copies when available.
- Using and supporting command personnel should be educated regarding the potential benefits to be derived from proper use of WSESA (LSA).
- Would like to procure on-site training course that covers types of material proposed for handbook.

V. NATO/NASA/OTHER GOVERNMENT AGENCIES

2

- Presents difficulties in obtaining appropriate data.
- Often produce prototypes with no logistics requirements identified.

VI. USAF PROJECT IMPACT

1

- Is it possible to get LSA requirements entered into system to aid in generation of RFPs and associated documents.

VII. SPACE DIVISION - DESIRED LSA DOCUMENTS

- Management tailoring guide.
- Management process document (MIL-STD-1388A).
- Technical procedures manual - to explain USAF use of LSA data to industry.
- An appendix to LSA Handbook may be required for SD.

VIII. ELECTRONICS SYSTEMS DIVISION

3

- Provide copy of draft handbook as soon as available.
- Would like to procure an on-site training course that covers type of material proposed for handbook.
- Need long-term dedicated LSA staff at AFSC/AL to assist product commands.

NEW DOCUMENTS IDENTIFIED

- SERD Flow Standardization Process dated 23 June 1982.
- AFALD P 70-1 RFP Acquisition Guide.
- MIL-STD-SDS, Defense Systems Software Development dated 15 April 1982.
- AFR 800-18 R&M (supersedes AFR 80-5).
- ESD ILS Handbook.

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END